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Safety in automation processes through alarms and events management

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As information technology advances, it makes possible improvements in the monitoring of industrial processes, improving safety and the management of engineering assets. The ANSI / API recommended practice 754 - 2010, sets new safety standards of the processes based on the monitoring of several protective barriers of a typical industry, such as, instrumented safety system, ESD (Emergency Shut Down), SDV's (Shutdown Valve), BDV (Blow down valve), alarm systems, operating activities, among others. The standard encourages the companies to create their own monitoring indices to minimize the probability of failure of such systems. In this talk we present the construction of a number of indicators for use in the oil and gas industry based on the information of alarms and events generated by the alarm system. We will also show how they are related to the fault detection and the overall security of the involved processes.

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Trends in machine functional safety

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In the early days of machine safety, the normal approach was to hard guard the machine, i.e., fence in the entire machine to totally restrict access. This worked for simple, single operation equipment, but with the dawn of manufacturing cells, robotics and open manufacturing, this approach was no longer feasible. A new method had to be developed. Initially, as the machining cell was designed, the first approach was to design out the hazardous areas. In other words, the cell was constructed in such a manner that most of the hazards were guarded against by burying them deep within the machine or providing a physical barrier to protect personnel from the hazards. This works for individual machines within the cell, but did nothing to protect personnel from the dangerous motions between multiple machines that comprised the cell. This conundrum brought about the rise of "Functional Machine Safety", and opened the way for innovative companies within the industrial sensor market to provide products to fulfill this need. Initially, standard limit and proximity switches were incorporated to signal when a door or gate was opened so the dangerous motion could be stopped. However, it was soon discovered that these devices could be easily defeated. A better, fail-safe method had to be developed. In addition, standards had to be written that dictated how these devices were to be designed and tested to make sure they could not be defeated and in the event of an internal failure, they would always fail in a safe condition. The first such approach was a dual, redundant contact, coded magnet reed switch. elobau sensor technology was one of the first developers of this type of switch. It fulfilled the need because it could not be easily defeated and it was tested for fail-safe operation. As technology progressed, programmable devices emerged as well as a new line of undefeatable switches based on RFID or Radio Frequency Identification. To accommodate these new devices, the standards controlling construction and testing of these types of devices were rewritten and are constantly undergoing changes and harmonization on a worldwide basis.

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